Summary of Sustainable Forestry Research

FY 2007

Michigan Department of Natural Resources

Purpose and Use of this Report

The State of Michigan, under the Michigan Departments of Natural Resources (DNR), Environmental Quality (DEQ), and Agriculture (MDA), supports research projects to ensure sustainable management of Michigan's forest lands. This document summarizes those projects in place during the fiscal year 2007 (October 1, 2006 - September 30, 2007). This document also fulfills the requirement of Forest Certification Work Instruction 5.1 "Coordinated Natural Resource Management Research" for an annual summary of research activities within forested landscapes. This report should be used to document the Michigan's commitment to sustainable forestry research and to inform discussion on research needs and collaboration opportunities in the DNR, DEQ, and MDA.

Research Summaries

Research is administered and supported differently in each Department and DNR Division. The Wildlife Division and Fisheries Division administer all research activities through their respective research sections. These Divisions also have a significant portion of their research efforts funded by a variety of federal grants that have annual reporting requirements. Forest, Mineral and Fire Management Division (FMFMD) does not have a dedicated research section; administration and support of research occurs through each program area.

The summary of research projects are organized into tables by Department and applicable DNR divisions. Each table is then organized by group based upon the objectives of the study. The group names provide a logical link to the themes of sustainable forestry and allow the reader to assess the breadth and depth of the DNR's research programs. One study could potentially fit into multiple groups. For purposes of simplicity, studies are listed in only one group. The group names are:

Ecological Processes;

Human Dimensions;

Chemical Use;

Forest Management

Wildlife Management;

Fisheries Management;

Environmental Protection;

Biological Diversity;

and Social Economic.

Table 1 DNR Wildlife Division Research Projects

Title
Ecological Process
- Importance of Coarse Woody Debris to Forest Songbirds
- Massasuaga Ecology and Response to Construction and Restoration Efforts
- Examining the structure and productivity of avian and vegetative grassland communities in Michigan CREP lands
- Coastal Wetlands in MI: 1) Effect of isolation on *Phragmites communis* expansion and use by wetland birds, 2) Effect of wetland isolation via dike construction on avian communities using Great Lakes wetlands
- Gray Wolf Population Modeling and Estimation Techniques
- Winter use by White-tailed Deer of Remnant Hemlock Stands in the Western Upper Peninsula
- Bear population modeling in Lower Peninsula
- Partners in Ecosystem Research and Management - several projects
Human Dimensions
- Assess Recreational Use of State Game and Wildlife Areas
Biological Diversity
- Bat community along Black Creek, Lenawee County, with emphasis on evening bat and Indiana bat
- Ecology and conservation of eastern fox snakes in SE Michigan
- Modeling the Cumulative Effects of Aspen Management Practices on Wildlife Species, Communities, and Habitat Suitability at Multiple Spatial Scales
- Planning for the Management of Wolves in the UP of Michigan
- Improving the Quality and Impact of Wildlife Management Outreach in Michigan
- Developing a Sharp-tailed Grouse Monitoring Program in the Eastern Upper Peninsula
Social and Economic
- Refining wildlife habitat models for land use support decisions
- Lanscape Ecology of White-tailed Deer in Agro-Forest Ecosystems: A Cooperative Approach to Support Management (Multi-State Project, Michigan Component)

Table 2 DNR Forest, Mineral, and Fire Management Division Research Projects

Project Title and Summary
Ecological Processes
- Michigan Natural Features Inventory: Natural Features Inventory of the Michigan State Forests & Other Studies of Natural Features.
Forest Management
- Integrated Forest Monitoring, Assessment and Prescription (IFMAP): Development of a GIS -based inventory system for Michigan State Forests.
- Vegetative Management System (VMS) for timber treatments: Develop and implement a computerized timber sale treatment tracking system.
- Forest Fire Experiment Station: Design, develop, and build prototype and operational equipment units for mechanized forest fire fighting.
- Roscommon Equipment Center: Design and develop specialized equipment for forest fire fighting.
- Michigan Tree Improvement Center: Funding for center to do Tree Improvement Studies and implement nursery practices to improve quality of tree seedlings produced in Michigan State Forest Nurseries
- Seedling, Nursery and Tree Improvement Projects: Support for MichCoTip and the Aspen-Larch Cooperative Studies
- Wyman Nursery Improvement: Improvements of production of nursery stock and seedlings.
- Forest Inventory Analysis: Conduct the re-measurement of the FIA plots for Michigan
Environmental Protection
- Beech Bark Disease Monitoring: To develop and implement a statewide beech bark disease monitoring and impact analysis system
- Beech Bark Disease: Development of a statewide Beech Bark Disease Monitoring and Impact Analysis Plot Network.
- Oak Wilt Detection, Monitoring & Control: Oak Wilt Sample Analysis for delimitation of infected areas

Table 3 DNR Fisheries Division Research Projects

Title
Ecological Processes
- Dynamics of the Lake Erie walleye and yellow perch populations and fisheries
- Fish community status in Saginaw Bay, Lake Huron
- Assessment of chinook salmon and coho salmon populations and their prey in Eastern Lake Michigan
- Evaluation of lake sturgeon populations in the St Clair River and Lake St Clair, Michigan
- Continued monitoring of yellow perch and walleye populations in Michigan waters of Green Bay, Lake Michigan
- Inventory and classification of Michigan rivers and river fish communities
- Prey selection and predation rate of piscivorous fish
- Patterns in community structure, life histories, and ecological distributions of fishes in Michigan rivers
- The importance of trophic interactions for salmonine fisheries of the Great Lakes
- Effects of Piscirickettsia infection on the muskellunge population of Lake St. Clair
- Factors Affecting Lake Sturgeon Recruitment: A model system for species recovery in Michigan waters of the Great Lakes
- Evaluation of trends in growth and relative abundance of lake whitefish in Lake Michigan
- Evaluating movements of juvenile lake sturgeon
- Tittabawasee River Assessment
- Development and implementation of a Fish Health Initiative for Michigan Inland and Great Lakes Fisheries
- Classification and analysis of Great Lakes fisheries habitats
- The Digital Water Atlas and resource guide for Michigan's inland waters
- Developing a lake classification system for Michigan inland lakes
- Streams habitat status and trends
- Ecological inventory of inland lakes
Human Dimensions
- Charter boat catch and effort from the Michigan waters of the Great Lakes
- Inland creel surveys
- Fisheries Stewardship and Heritage Outreach/Research (SHOR) Initiative
Fisheries Management
- Measurement of sport fishing harvest in lakes Superior, Michigan, Huron, and Erie

- Vital statistics of walleye in Saginaw Bay
- Evaluation of lake trout stocks in Lake Huron
- Statewide coded-wire tagging and tag recovery program
- Investigations into causes of, and solutions for, variable survival of chinook salmon stocked into Lake Huron
- Population dynamics of yellow perch stocks in Michigan waters of Lake Michigan
- Assessment of lake trout populations in Michigan's waters of Lake Michigan
- Performance, survival and production of steelhead strains in tributaries of Lake Michigan
- Status of Lake St Clair fish community and sport fishery
- Assessment of lake trout populations in Michigan waters of Lake Superior
- Evaluation of returns of salmonids to weirs in Michigan's waters of the Great Lakes
- Evaluation of the relative growth and survival of Assinica, Nipigon, and Iron River-strain brook trout stocked into small inland lakes
- Colonization of a brook trout stream by introduced brown trout
- Evaluation of Michigan's inland fish stocking program and optimizing allocation of stocking resources by a systems analysis
- Influence of lotic and near shore habitats on fish populations in Great Lakes and inland lake ecosystems, with emphasis on walleye
- Assessment of predator-prey balance for Lake Huron fishery management
- Quantitative support for inter-jurisdictional fisheries management
- Mortality of walleye
- Evaluation of brown trout and steelhead competitive interactions in Hunt Creek, Michigan
- Evaluation of lake sturgeon populations in northern Michigan
- Investigation of causes of declines in Au Sable River brown trout populations
- Ecological river classification as a basis for management of cold water streams
- Pond rearing of juvenile lake sturgeon
- Influence of total length and condition at stocking on chinook salmon survival and time at large
- Northern Lake Huron, Cool water Fish Community Assessment
- Comparison of the recreational fisheries produced by stocking of spring and fall yearling brown trout, Lake Huron
- Decision-support tools for managing fisheries of inland lakes
- Lakewide assessment of the contribution of natural recruitment to the chinook salmon population of Lake Huron
- Development of fisheries assessment and harvest allocation methods for inland

lakes and streams in Michigan

- Improving fishery stock assessments in the Great Lakes
- Effects of exploitation and fisheries management on genetic diversity of fish stocks in inland and Great Lakes waters of Michigan
- Fisheries assessments in large, inland lakes of Michigan
- Status and trends of fish populations and community structure in Michigan streams
- Towards comprehensive databases and coordinated fish surveys for ecosystem management in the Great Lakes
- Evaluation of Eagle Lake and steelhead-strain rainbow trout stocked into inland lakes in Michigan
- Using population and community dynamic models and quantitative fisheries analysis to promote improved fisheries management in the Great Lakes
- Linking fish population models with aquatic habitat conditions to enhance lake and stream fishery management in Michigan
- Developing decision tools for inland lake management through field sampling and statistical models linking lakes to landscape context

Environmental Protection

- Groundwater Assessment Tools
- Managing Michigan Lakes: Evaluating Effects of Watersheds and Habitat Perturbation on Lake Resources
- Implications of lakeshore development for fishery resources in Michigan
- Improve and validate river segment identification and classification models for assessing fishery potential and environmental impairment in Michigan
- Impact of removal of Stronach Dam, Manistee County

Biological Diversity

- Status and trends of inland lakes: methods development, program oversight, and ecological assessment
- Design, analysis, and implementation of aquatic resource inventory in Michigan
- Development and implementation of conservation genetic initiatives for Michigan inland and Great Lakes fisheries
- Development of a GIS for inventory, classification, and management of non-game wildlife in Great Lakes waters

Social Economic

- Using economic models and quantitative human dimensions analysis to promote improved fisheries management in the Great Lakes.

Table 4 DNR Parks and Recreation Division Research Projects*

*No projects were funded in 2007 but future projects of this nature are planned.

Table 5 Michigan Department of Agriculture Research Projects

Title
Ecological Process
- Evaluation of Disease and Insect Resistant Elm Hybrids and Selections for the Michigan Climate
- Identifying invasive plants in Michigan through the Michigan Plant Invasiveness Assessment System
- Alternative Production Systems for Landscape Nursery and Christmas Tree Production
Environmental Protection
- Water Conservation Practices for Michigan Container Nurseries
Social and Economic
- Alternative Production Systems for Landscape Nursery and Christmas Tree Production

Table 6 Michigan Department of Environmental Quality Research Projects

Title
Environmental Protection
- Clean Michigan Initiative grants for water quality monitoring.

Integration and Use of Research in the DNR

Research that supports sustainable forestry in the DNR occurs through a variety of mechanisms. The DNR supports a large number of research projects contracted through multiple universities within the state. The DNR supports university faculty positions through their DNR's Partnership for Ecosystem Research and Management (PERM) program. The DNR also employs its own research and monitoring staff in FMFMD, Wildlife Division, and Fisheries Division.

Michigan DNR research programs cover the entire breadth and depth of sustainable forestry. While each Division uses a different array of means to communicate research findings, the research programs are well integrated with the operations of the DNR and are providing useful information to support improvements in business practices. Division in-service trainings, specialist meetings, and ongoing field and program communications are examples of the means used to convey research information to DNR personnel. For more information about specific research projects listed in the tables above, interested parties should contact the research coordinator for that Division. Table 7 lists the research coordinator for each Division.

Table 7. DNR Research Coordinators.

DNR Division	Coordinator	Phone number	Email
FMFMD	Ronald Murray	517-335-3353	MurrayR@Michigan.gov
Wildlife	Patrick Lederle	517-373-9338	LederleP@Michigan.gov
Fisheries	Paul Seelbach	734-663-3554	SeelbacP@Michigan.gov